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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/774,157	01/29/2001	Richard Anthony Cox	7000/1	1034

27774 7590 07/17/2003

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EXAMINER

SODERQUIST, ARLEN

ART UNIT	PAPER NUMBER
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1743

DATE MAILED: 07/17/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Applicati n N .

09/774,157

Applicant(s)

COX ET AL.

Examin r

Arlen Soderquist

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 April 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-43 is/are pending in the application.
- 4a) Of the above claim(s) 37-43 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-36 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 January 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

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1. Applicant's election without traverse of Group I in Paper No. 9 is acknowledged.
2. The disclosure is objected to because of the following informalities: there is not a reference to figure 6 in the detailed description of the invention.

Appropriate correction is required.

3. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the means for adding or removing a gas as found in claims 4-5 and 16-17 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1, 4 and 11 rejected under 35 U.S.C. 102(b) as being anticipated by Wendelin. In the patent Wendlin teaches that when it is required to regulate the flow of ozone in accordance with prevailing levels of ozone, the apparatus according to FIG. 2 may be used. This apparatus comprises the same elements 2 to 7 as the FIG. 1 embodiment, although in this case the ozone-monitoring device 2 is placed downstream of the spray means 7 and is arranged to monitor residual quantities of ozone in the flow of air having passed the space 9. Amplification of the signals received by the amplifier 3 is dependent upon the levels of ozone detected, and the valve 4 is opened or closed progressively in dependence upon the value of respective signals. Thus, initially the valve is fully closed, so that no nitric oxide is fed to the space 9. When the monitor 2 senses the presence of ozone above a given limit, the signal will be greatly amplified such as to cause the valve 4 to be fully opened. As the level of ozone progressively decreases, subsequent to the introduction of NO to the space 9, amplification of the signals from the monitor 2 is decreased to a corresponding extent, causing the valve 4 to be progressively closed so that the amount of NO dispensed to the space is commensurate with that required to reduce the sensed

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level of ozone. In this embodiment the amplifier 3 may be connected to a quantizer (not shown) having a plurality of outputs of different signal levels.

6. Claims 1-2 and 11-12 are rejected under 35 U.S.C. 102(b) as being anticipated by Guicherit. In the abstract and as admitted on page 1 line 23 to page 2 line 19 of the instant specification Guicherit teaches an indirect method of determining nitrogen oxides by a chemiluminescent method. NO₂ concentrations in outdoor air can be determined indirectly by measuring the equilibrium ozone concentration under continuous UV irradiation. This concentration can be measured very accurately by a chemiluminescence technique using Rhodamine B as a light emitting compound. The equilibrium ozone concentration on photolysis of the NO₂ present is a function of the wavelength, the light intensity, and the temperature. By keeping these parameters constant, NO₂ concentrations can be determined very accurately with a lower detection limit of 5 µg NO₂ m⁻³ air.

7. Claims 1-2 and 11-12 are rejected under 35 U.S.C. 102(b) as being anticipated by Ortman. In the abstract Ortman teaches an ozone precursor monitor for investigating air pollution. A new automated method and a monitoring system were developed for quantitative determination of O₃ precursors (e.g.; hydrocarbons, NO, and NO₂) in the lower atmosphere. In this system, an O₃ analyzer is coupled to reaction vessels contained in an irradiation chamber. At timed intervals, discrete samples of outside air are drawn into the reaction vessel and irradiated with UV light. The amount of O₃ produced is a measure of the photochemical reactivity potential of the precursor blend. The title monitor is designed for urban air sampling stations where analyzers for the principal air pollutants are routinely operated. However, it is suitable for forecasting elevated O₃ concentrations, assessing the photoreactivity of solvents, and investigating the transport of O₃ precursors from urban to rural areas.

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

9. Claims 3-10 and 13-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ortman as applied to claims 1-2 and 11-12 above, and further in view of Burrows or Stuhl. Ortman does not teach measurement of the modulated irradiation of the sample.

In the paper Burrows teaches observing kinetics of the reaction of hydroxyl radical with perhydroxyl radical by modulated photolysis of the ozone-water vapor system. The modulation technique was employed to observe the kinetic behavior of OH and HO₂ radicals in the 253.7 nm photolysis of O₃-H₂O-O₂-N₂ (or O₃-H₂O-O₂-He) mixtures at 1 atmosphere pressure. The radicals were monitored by absorption at 308.2 nm and 210 nm, respectively. O₃ was also monitored. The rate coefficient for the reaction OH + HO₂ → H₂O + O₂ was (determined by computer simulation) $k_6 = (6.2 \pm 4.0/2.0) \times 10^{-11} \text{ cm}^3/\text{mol-s}$, independent of temperature in the range 288-348 K. The possible role of HO_x complexes in this reaction is discussed. In the last full paragraph of page 148 Burrows teaches that the modulated photolysis measures both the concentration and lifetime of the species.

In the paper Stuhl discusses measurements of rate constants for termolecular reactions of O(3P) with nitric oxide, molecular oxygen, carbon monoxide, molecular nitrogen and carbon dioxide using a pulsed vacuum-UV photolysis-chemiluminescent method. Absolute rate constants for a number of termolecular reactions of O atoms were determined at 300 K. O atoms were generated by pulsed vacuum-UV photolyses of NO, O₂, CO₂, and N₂O and were monitored by NO₂* or CO₂* chemiluminescent emission. In the paragraph bridging pages 3943 and 3944 Stuhl teaches that the pulsed technique used has a high detection sensitivity with fast time resolution.

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It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the flash or modulated photolysis as taught by Stuhl or Burrows into the Ortman device and method because of the ability to measure both concentration and lifetimes as taught by Burrows and the high detection sensitivity and fast time resolution as taught by Stuhl.

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The cited art relates to changing the concentration of one of the claimed compounds in a measuring method.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Arlen Soderquist whose telephone number is (703) 308-3989. The examiner's schedule is variable between the hours of about 5:30 AM to about 5:00 PM on Monday through Thursday and alternate Fridays.

For communication by fax to the organization where this application or proceeding is assigned, (703) 305-7719 may be used for official, unofficial or draft papers. When using this number a call to alert the examiner would be appreciated. Numbers for faxing official papers are 703-872-9310 (before finals), 703-872-9311 (after-final), 703-305-7718, 703-305-5408 and 703-305-5433. The above fax numbers will generally allow the papers to be forwarded to the examiner in a timely manner.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.



July 14, 2003

ARLEN SODERQUIST
PRIMARY EXAMINER